Book problems: p. 434

#20, 22, 48, 50

20) $p = 0.44$ $n=244$

STATE	**CHECK**
(1) SRS	assumed
(2) $np \geq 10$	$107.36 \geq 10$
$nq \geq 10$	$136.64 \geq 10$
(3) pop > 10n	there are more than 2440 binge drinkers

$N(0.44, 0.03)$

$P(\hat{p} < 0.3934) = \text{normalcdf}(-E99, 0.3934, 0.44, 0.03) = 0.0602$

This sample only happens about 6% of the time. That is unusual.

6th percentile

22) $p = 0.92$ $n = 160$

STATE	CHECK
(1) SRS	assumed
(2) $np \geq 10$	$147.2 \geq 10$
$nq \geq 10$	$12.8 \geq 10$
(3) pop > 10n	there are more than 1600 seeds

$N(0.92, 0.02145)$

$P(\hat{p} > 0.95)$ = normalcdf(0.95, E99, 0.92, 0.02145) = 0.081

48) N(10.2, 0.12)

(a) $P(X < 10)$ = normalcdf(-E99, 10, 10.2, 0.12) = 0.0478

(b) P(underweight) = 0.0478 P(underweight^c) = 0.9522

$P(U^c \cap U^c \cap U^c) = (0.9522)(0.9522)(0.9522) = 0.8633$

(c) n = 3

STATE	**CHECK**
- SRS	- assumed representative
- $n \geq 30$ or normal pop	- stated normal population
- pop $\geq 10(n)$	- total # potato chip bags ≥ 30

N(10.2, 0.0693)

(c) continued....

$P(\bar{x} < 10)$ = normalcdf(-E99, 10, 10.2, 0.0693) = 0.00195

(d) n = 24 checks still pass from before

N(10.2, 0.0245)

$P(\bar{x} < 10)$ = normalcdf(-E99, 10, 10.2, 0.0245) = 0

50) skewed $\mu=32$ $\sigma=20$

(a) $P(X > 40) = ???$

we can't do this because the population is not normal, so we can't use normalcdf

(b) $n = 10$

STATE	CHECK
- SRS	- assumed representative
- $n \geq 30$ or normal pop.	- $n < 30$ and pop. is NOT normal!

(c) n = 50

** checks pass:

STATE	**CHECK**
- SRS	- assumed representative
- n $\geq$ 30 or normal pop	- n = 50 $\geq$ 30
- pop $\geq$ 10(n)	- total # customers $\geq$ 500

N(32, 2.828)

P($\bar{x}$ > 40) = normalcdf(40, E99, 32, 2.828) = 0.0023

no, not likely.